(Bad copy)

SQ -10

SERVICE MANUAL
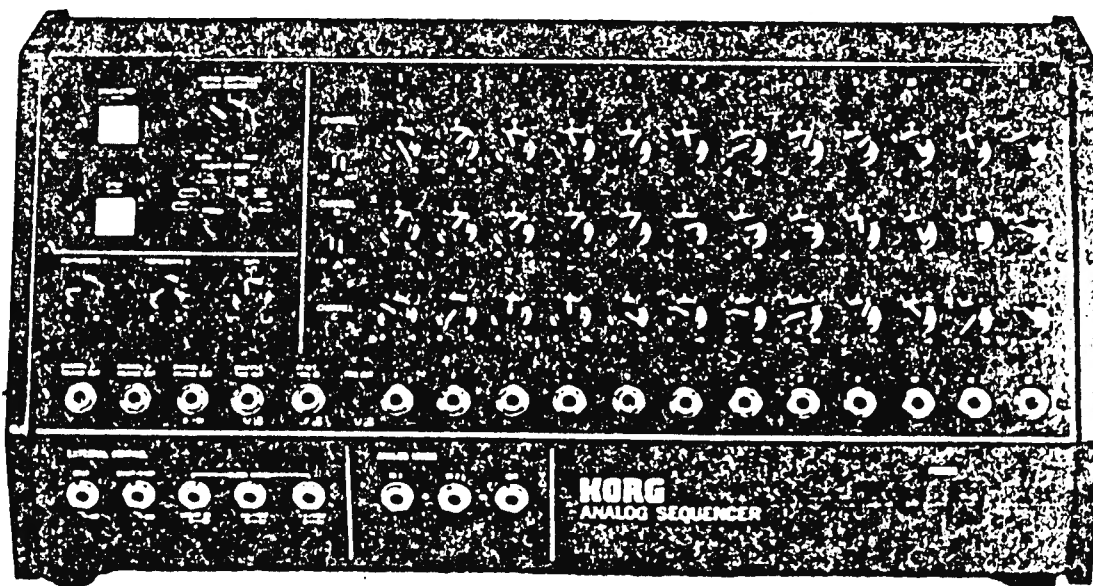
KEIO ELECTRONIC LAB., CORP.
TOKYO, JAPAN

A OUT

B OUT

C OUT

A B
5V 5V
1V 1V

ANALOG OUTPUT CIRCUIT

A B
PORTAMENTO

AV
BV
CV

SCANNER

12

A B C

MULTIPLE TRIG OUT

SEQUENCE COUNTER

VOLTAGE CONTROLLED CLOCK GENERATOR

CONTROL CIRCUIT

START STEP DUTY MODE

IN 1
IN 2

OUT

ANALOG MIXER

POWER SUPPLY

+15V
+7.5V
-7.5V
-15V
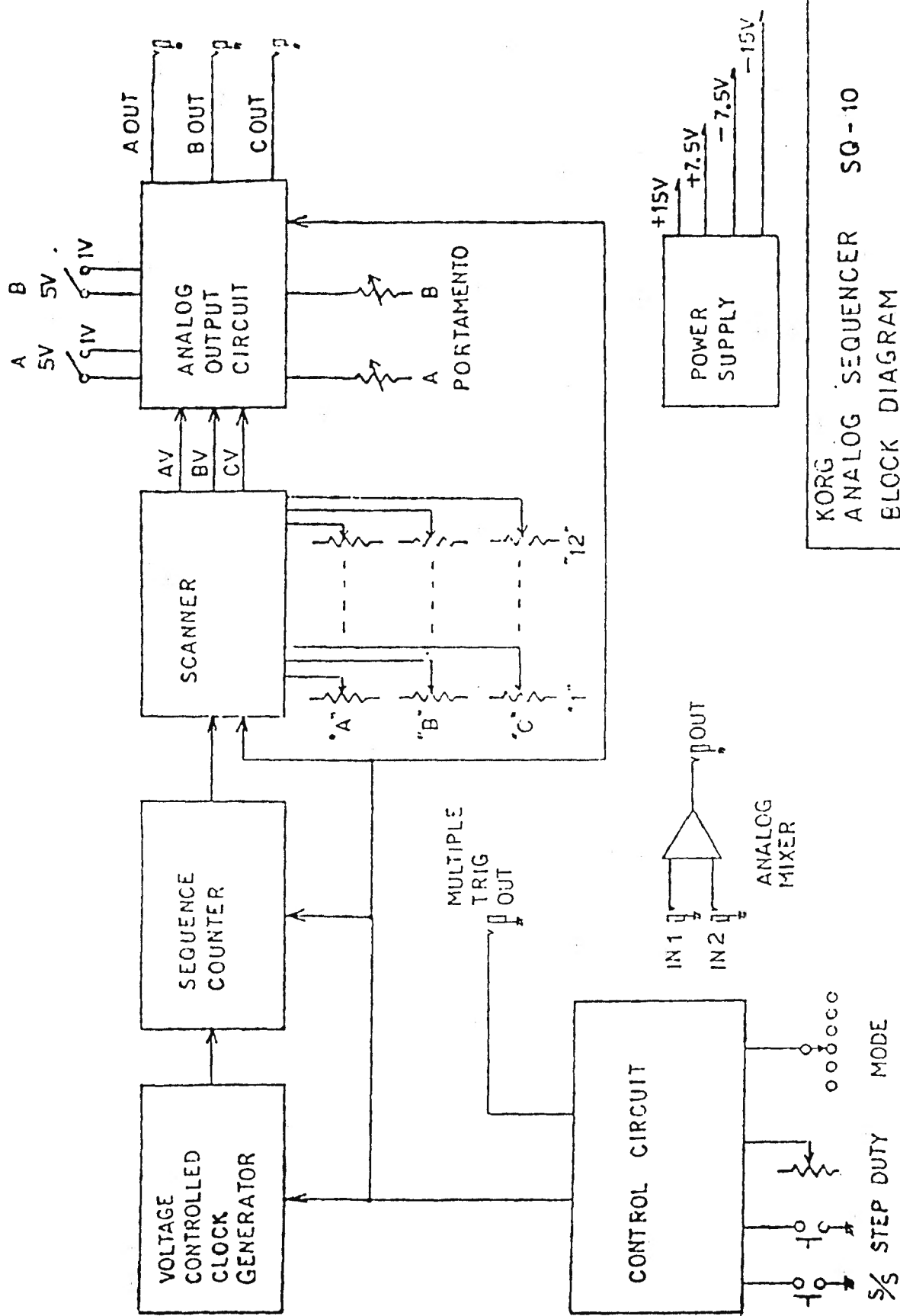
KORG
ANALOG SEQUENCER SQ-10
BLOCK DIAGRAM

DATE MAY 1976 DWG

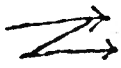KOD-R4000J-6

Checking and Adjustment

Power Check & Adjust

1. +15V: Should be 14.4V~15.6V.

2. -15V: Should be -14.4V~-15.6V.

3. +7.5V: Adjust VR46 to 7.50V.

4. -7.5V: Adjust VR47 to -7.50V.

Function Test -- Standard -- Connect MS-10 (fig 1)

Set MS-10 and SQ-10 controls (fig 2)

(fig-3)

No.	Mode Rotary switch	Check
2.		Clock LED flashes on and off.
3.		'12' LED turns on first. Then 1 and 2

each time step button is pressed, so the sequence goes 12 , 1 , 2.

A and B LED's do not turn on in this mode.

4. LED's 1 through 12 should be off at first. When S/S switch is pressed, sequence goes 1 , 2 ....

12 , 1 , 2 ....When S/S switch is pressed again,

LED's go out. A and B do not light.

5. LED's 1 through 12 should be off at first.

When you turn on the S/S switch, the sequence should

automatically advance 1,2,...12... and then stop after

one time, If you press the S/S switch between 1 and 12,

the sequence should stop. A and B do not turn on.

6. B and 12 are on at first. A and 1 turn

on when you first press the Step switch. Press it again

for 2...12; again for B 1...12; and again for A 1...

7. A and B and 1 through 12 should all be

off at the beginning. When you press the S/S switch,

the sequence should go A 1...12, B 1...12, A 1... automatically.
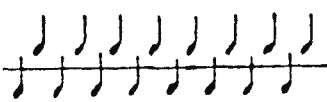
Press the S/S switch again to stop.
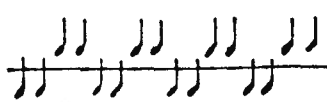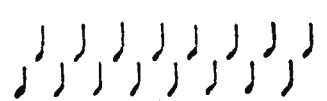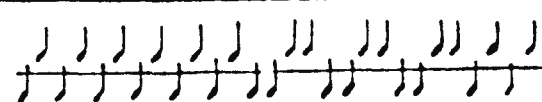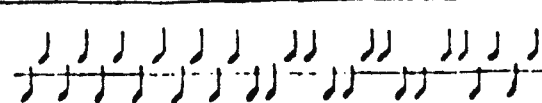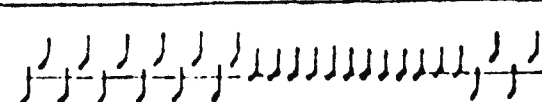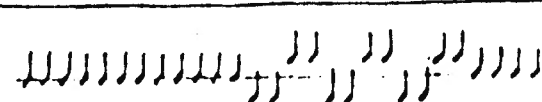
8. ⟋→ At the beginning A and B and 1 through 12
should all be off. Press the S/S switch and there should
be a single cycle of A 1...12 and B 1...12. Then it should
stop. It should also stop if you press the S/S switch
while the LED's are changing.

Function Test (2)

O means the phone plug connected to the MS-10 CV IN.

⊠ means the phone plug connected to the opposite side (open).
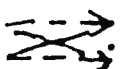
FUNCTION TEST (2)

NO	MODE Rotary SW	(OUTPUT)			musical interval
		A	B	C	
9	(→)	O			♩♩♩♩♩♩♩♩ - - - - - - -
10			O		♪♪ ♪♪ ♪♪ ♪♪ - - - - - -
11				O	♩♩♩♩♩♩♩♩ - - - - - -
12	(⨯→)	O			♩♩♩♩♩♩♪♪ ♪♪ ♪♪♩ - - - -
13			O		♩♩♩♩♩♩♪♪ ♪♪ ♪♪♩ - - - -
14		O	⊗		♩♩♩♩♩♩♪♪♪♪♪♪♪♪♪♪♩♩ - - - -
15		⊗	O		♪♪♪♪♪♪♪♪♪♪♩♩ ♪♪ ♪♪♩♩♩♩ - - - -

OUTPUT CHECK

NO.	"1" STEP VR3	MODE	5V-1V sw A	5V-1V sw B	Digital volt MT A	Digital volt MT B	Digital volt MT C	measure step	Limit
28			5V		O			"1"	+ 4.90 ~ + 5.10 V
29			1V	5V	O			"1"	+ 0.95 ~ + 1.05 V
30	"1" A B C	⊏⟶				O		"1"	+ 4.90 ~ + 5.10 V
31				1V		O		"1"	+ 0.95 ~ +1.05 V
32							O	"1"	+ 4.90 ~ + 5.10 V
33					O			"A""1"	+ 4.85 ~ +5.15 V
34			5V	5V	O			"B""1"	+ 4.85 ~ + 5.15 V
35		⤫⟶			O			"A""1"	− 4.85 ~ − 5.15 V
36	"1" A B C				O			"B""1"	− 4.85 ~ − 5.15 V
37					O			"1"	− 4.90 ~ − 5.10 V
38		⊏⟶				O		"1"	− 4.90 ~ − 5.10 V
39							O	"1"	− 0.10 ~ + 0.10 V

O Digital voltmeter to measure the Phone jack

Function Test (3)

No.	Item	Check
16	Portamento-A	Portamento effect should only show up in the channel A output when you turn up this knob.
17.	Portamento-B	Portamento should only show up in the B channel output.
18.	Duty	Should get shorter when knob is turned counter-clockwise. Should get longer when turned clockwise. ⟨TRIG⟩
19.	Reset, Trig Out (1~11)	Connect RESET IN jack to each of TRIG OUT jacks 1 through 11 in turn, and see that the sequence returns to 1 after reaching the proper step. Disconnect after check.
20.	Trig Out (12)	With TRIG OUT 12 connected to the MS-10 TRIG IN jack, see that there is only a sound produced at the 12th step in a sequence. Disconnect after check.
21.	Step (jack)	Set mode to ⟶. Connect MS-10 momentary switch to STEP jack and see that steps advance when you press the MS-10 switch. Set mode back to ⟷ and disconnect after check.
22.	Start/Stop (jack)	Connect MS-10 momentary switch to S/S jack,

and see that the MS-10 switch will turn the S/S on and off.
Disconnect after check.

23. Linear In   Connect MS-10 control wheel ⌓ out to
                 LINEAR IN jack, and see that the clock
                 speed changes with input voltage. It should
                 get faster toward +5V. Disconnect after check.

24. x2/V   Connect MS-10 ⌓ out to x2/V jack, and see
                 that clock speed changes with input voltage.
                 Speed increases towards +5V. Disconnect
                 after check.

25. +2/V   Connect MS-10 ⌓ out to +2/V jack, and see
                 that clock speed changes with input voltage.
                 Speed should decrease toward +5V. Disconnect
                 after check.

26. Clock   Turning the CLOCK knob all the way counter-
                 clockwise should slow down the cycle 10sec ~ 40sec.
                 Turning the knob clockwise should speed up the
                 clock.

27. Analog   The sum of IN 1 and IN 2 voltages should
    Mixer   appear in the OUT voltage.
                 For example: Connect MS-10 ⌓ out to IN 1;
                 Connect SQ-10 multiple trigger out to IN 2;
                 Connect MS-10 CV IN to OUT.

Multiple trigger signal should modulate pitch of note
when keyboard is played (or momentary switch is pressed)
on MS-10. Changing IN 1 input voltage (from control wheel)
will vary entire pitch.

TRIG IN

±5V OUT

SIG OUT

VOL

2~10

KBD

TRIG

VCA

VCF

EG

VCO

MG

NG

FREQ CV IN

KORG MS-10

fig-2

EG

HOLD 0

ATTACK 0

DECAY .10

SUSTAIN 10

RELEASE 0

VCA

EG EXT

MG

WAVE FORM

FREQ

VCF

3~10 Ic

PEAK 0

Ic M

MG 0

EG EXT 0

VCO

WAVE FORM

PW PWM

FM 0

MG 0

EG EXT 2~4

SCALE 8,4'

PITCH

PORT 0

EXT SIG 0

+5V

0V

-5V

KORG
ANALOG SEQUENCER

fig-3

CLOCK

MODE

S/S

STEP

PORTAMENT PORTAMENT B   DUTY

A
B

EXTERNAL CONTROL
STEP   S/S   LIN   X3   X2
A OUT B OUT C OUT M.T. RESET

ANALOG MIXER
IN 1   IN 2   OUT
+   =   ÷2

POWER   ON

Checking with MS-10

AMP

MS-10

SQ-10

A B C TRIG

INPUT —— SIG OUT
AMP   MSIG   SQ-10
           VCO FREQ CVIN ———— A OUT
           TRIG IN ———— MULTIPLE TRIG OUT   fig-1

See other chart for MS-10 control settings

LED L

SLIDE SWITCH
SSB-122

LED L

SLIDE SWITCH
SSB-122

BE8P-SHF-1

BE4P-SHF-1

33K

100K

100K

LED L

100K

100KB

100K

100K

100K

100K

100K

100K

ROTARY SWITCH
(1-2-6)
SRM1026

STOPPER

100KB

100KB

2MA

BE6P-SHF-1

BE7P-SHF-1

PUSH
SWITCH
AKC 2

PUSH
SWITCH
AKC 2

2MA

KLM-131A
KORG   SQ-10

SQ-10

SQ 10   KLM-132C

START/STOP   CLOCK
                    GENERATOR

STEP J
S/S J
LIN+
LIN-
×2
÷2

STEP SW 1
STEP 2
S/S SW 3
CLOCK 4
LED 5
DUTY 6
MT 7

J34

R98 10K
R101 1M
R102 10K
R103 1K
R104 100K
R105 100K
R106 100KF
R107 47K
R108 100KF

R116 1K
R117 100K
R118 1M
R119 1.8K
R120 1K
R121
R122 240K
470Ω
R135 2.2K
R141 470Ω
R142 2K
R144 100K
R147 100K

C3 0.1   R91 2.2K   C4 0.1   R96 2.2K   100K R99

R111 5.62KF
R112 200KF
R115 2.2M
C7 (0.001)
R123
R124 49.9KF
324 ICA

A   C16

R134 100K
R132 10M
D32
D33
R133 4.7K
IC B   082

R138 120K
R137 1K
R139 1K
R143 100K
018   C

4558

R92 1M   D24 47K   R93 47K   R94 47K   R97 1M   D25   R95 100K
4011   ICC   D28   R109 100KF   100KF   R113 220K   R125 2.2K   D31   R126 100K   R130 47K   R131 220Ω   D30
C1583   Q15   C9 (0001)   017   C   R135 10K   R136 10K   RVC 100K

013 C   014 C   R100 47K   C6   0.01   C5   100K   R105   100K   VR41   R114 15M   C8 001   R128 10K   R129 10K   R127 10K   J39   J40   C10 0.22   C11   C12   J43   J44   D34   J45
50V   D29 100K   R110 100K   1µ 50V

D27
J36   J35   D26   J37

301KF R165 ICD
324
R166 301KF
301KF R167
R168 150K   R169 75K   R170 150KF   R171 1K   VR42   082 ICE   1K R177   R180 1K   J83   J84   J90   D37   R186 100KF   R183 200KF   R189 100KF   J92   D39 D40
J82   H5 ABC   R174 1K   R175 75KF   R176 150K   R178 1.5K   VR43   R179 1.5K   VR44   D35 1.5K   1K   4066 ICG   J89 1.8K   R182   4558 ICF   R190 100KF   R193 470Ω   R194 470Ω
R173 75K   1K R177   J85   C18 0.22   J86 C19 0.22   R181   C   J87   D36   J88   J91   D38   R184 470Ω   VR45 1K   R185 4700   R187 1.5K   J93   R191 62K   R192 33K

ANALOG OUTPUT
CIRCUIT

H1
A×1SW 1
A×1 2
A PORT 3
B×1SW 4
B×1 5
B PORT 6
A-IN 7
B-IN 8

B+B
A+B
A+3
C
MTJ
RESET

KLM-132C   KORG

MIX　　SEQUENCE　　　　　　　　　　　　　　　CONTROL

SEQUENCE section:

IC X 4072
J55 H7
S7 S8 S9 S10 S11 S12
S1 S2 S3 S4 S5 S6
H6
J64 J65
2.2K R157
2.2K R158
Q21
R161 R162
100K
100K
100K
R163
100K
R164
J71
J72 J73
C17
104
4011 IC T
4011 IC S

J47 R150 100Ω
R151 100K
J51
J52
J53
J54
IC P 4028
J57
J58
J61 J62
ICO 4028
J63
Q20
R159 100K
100K R160
IC I 4023
J68
4011
J74 J75
IC U 4011
J81

RT53
ICC 100K
J48
J49
IC J 4001
J50
J56
C14 680P
IC R
4011
10K R154
J59
J60
10K R155
0.001 C15
IC L 4027
J66 J67
4027
100μ/16V IC M C16
4027
J69 J70
330P C30
ICN
J76 J77
4011 IC Y
J78 J79
J80
J109

J96 J97 J98 J99 J100 J101 J102
J103 J104 J105 J106
100K R196 D45 10K R198
10K R156
J108
J106

D43 J112 J113 J114
D44 J111 J110 J115 J116
470Ω R195
H8
100K R197 Q22
C23 A C
100K R199
13K R200
R202 4.7K
C21 10μ/16V C22
104
C23 10μ/16V
0.01 C20
4.7K R201
1K VR46
R203 1.8K
2.2K R204
100Ω R205
C A Q24
DZ1 5.1V
1K VR47
DZ2 5.1V
R206 1.8K
Q25 A
C25
1.8K R207 2.2K R208 100Ω
10μ/16V C24 10μ/16V C26

Q26 2SC 1226
7815 IC W
7915 IC X
2SA 699 Q27

470μ/25V C27
470μ/25V C28

D20
D21
D22
D23
AC IN
270Ω R209
LAMP GND

LED +7.5 -7.5 +7.5
H4
1 -7.5
2 GND
3 +7.5
4 MT

S Q - 1 0   RESET   POWER SUPPLY

SQ10   KLM-133A

Q1   470Ω 1K   R68 O2   470Ω 1K   Q3   R70   O4   470Ω 1K   O5   470Ω 1K
R67 R79   470Ω1K   R69 R81   470Ω1K   R82   R71   R83   R72   R84
47K   R80   R55   L   R44   L   R45   L   R46   L   R47   L
R43   LED1   R56   D10   R57   47K   D11   R58   D12   R59   D13   R60
1μ/50V C1   D8   D9   10K   47K   10K   47K   10K   J7   47K   10K   47K   10K
C2   104   10K   10K   LED2   LED3   LED4   LED5   LED6

VR2   J6   VR3   J24   VR4   VR5   VR6
VR1   J22   J23   J12   J13   J25   J14   J26
100KB   J10   100KB   J11   100KB   100KB   100KB   100KB

4007   4007   4007   4007   4007   4007
IC1   IC2   IC3   IC4   IC5   IC6

100KB   VR13   100KB   VR14   100KB   VR15   100KB   VR16   100KB   VR17   100KB

301K   301K   301K   301K   301K
R7   R8   R9   R10   R11

301K   301K   301K   301K   301K
R19   R31   R20   R32   R21   R33   R22   R34   R23   R35
301K   301K   301K   301K   301K

100KB   100KB   100KB   100KB   100KB   100KB
VR25   VR26   VR27   VR28   VR29

KLM-133A   KORG   SQ-10

O7 O8 O9 O10 O11 O12

470Ω 1K R73 | R85 470Ω 1K R74 | R86 470Ω 1K R75 | R87 470Ω1K R76 | R88 470Ω1K R77 | R89 470Ω1K R78 | R90

R48 L R49 R50 R51 R52 R R53 R54

LED7 LED8 LED9 LED10 LED11 LED12

1K D14 R61 10K D15 R62 10K 47K D16 R63 10K 47K D17 R64 10K 47K D18 R65 10K 47K D19 R66 10K 47K

10K 47K

J8 J9 J15 J27 J16 J28 J17 J29 J18 J30 J19 J31 J20 J32 J21 J33

VR7 VR8 VR9 VR10 VR11 VR12

100KB 100K B 100KB 100XB 100KB 100KB

4007 4007 4007 4007 4007 4007

IC7 IC8 IC9 IC10 IC11 IC12

VR18 100KB VR19 100KB VR20 100KB VR21 100KB VR 22 100KB VR23 100KB VR24

301K R12 301K R13 301K R14 301K R15 301K R16 301K R17 301K R18

301K R36 301K R37 301K R38 301K R39 301K R40 301K R41 301K R42

R24 R25 R26 R27 R28 R29 R30

301K 301K 301K 301K 301K 301K 301K

100KB 100KB 100KB 100KB 100KB 100KB

VR31 VR32 VR33 VR34 VR35 VR36

⑤ = 2SC1KP5

SQ-10
KLM-133A
KOD-F10004

KLM132 : MAIN CIRCUIT BOARD
KLM133 : SEQUENCE CIRCUIT BOARD
KLM131 : CONTROL CIRCUIT BOARD

K 2SA564 PNP
K 2SC1685 NPN

OP Amp : ±15V
ANALOG SW : ±7.5V
DIGITAL IC : ±7.5V

START / STOP
STEP1
STEP2
RESET
MIXER OUT

X ½ / VOLT
X2 VOLT

+15V
+7.5V
GND
−7.5V
−15V
LAMP

.M132: MAIN CIRCUIT BOARD
.M133: SEQUENCE CIRCUIT BOARD
.M131: CONTROL CIRCUIT BOARD

2SA 564 PNP
.2SC1685 NPN

OP Amp : ±15V
ANALOG SW : ±7.5V
DIGITAL IC : ±7.5V